

- 1 1. A reinforced shrink wrap comprising:
2 a first layer of thermoplastic;
3 a second layer of thermoplastic;
4 at least one layer of said first and second layers comprising a shrink film of
5 highly irradiated polyolefin;
6 a reinforcing grid disposed between the first and second layers of
7 thermoplastic; and
8 a tie layer of elastomeric material disposed between the first layer and the
9 second layer holding the reinforcing grid but allowing slippage of the reinforcing
10 grid in the tie layer upon tensile loading,
11 wherein the first layer, the second layer, the reinforcing grid and the tie layer
12 are laminated together to form the reinforced shrink wrap, and wherein the
13 elastomeric tie layer has a lower modulus than at least one of the thermoplastic
14 layers.
- 1 2. A reinforced shrink wrap of claim 1 wherein the shrink film of highly irradiated
2 polyolefin is polyethylene.
- 1 3. A reinforced shrink wrap of claim 1 wherein the reinforcing grid is a non-woven
2 scrim.
- 1 4. A reinforced shrink wrap of claim 3 wherein the reinforcing grid material is selected
2 from the group consisting of nylon filament and polyester filament from about 200
3 to about 800 denier.
- 1 6. A reinforced shrink wrap of claim 1 wherein at least one of said thermoplastic layers
2 includes multiple plies of thermoplastic.
- 1 7. A reinforced shrink wrap of claim 1 wherein the tie layer is from about 0.75 to about
2 1.5 mils in thickness.

- 1 8. A reinforced shrink wrap of claim 1 wherein the first and second layers of
2 thermoplastic are from about 0.75 to about 6 mils thick.
- 1 9. A reinforced shrink wrap of claim 1 wherein at least one of the thermoplastic layers
2 includes an additive selected from the group consisting of ultraviolet stabilizer, flame
3 retardant, static inhibitor, color additive, antioxidant, corrosion inhibitor, biocide and
4 mixtures thereof.
- 1 10. A reinforced shrink wrap of claim 1 wherein the tie layer includes an additive
2 selected from the group consisting of ultraviolet stabilizer, flame retardant, static
3 inhibitor, color additive, antioxidant, corrosion inhibitor, biocide and mixtures
4 thereof.
- 1 11. A reinforced shrink wrap of claim 6 wherein at least one ply of thermoplastic
2 contains an additive selected from the group consisting of ultraviolet stabilizer, flame
3 retardant, static inhibitor, color additive, antioxidant, corrosion inhibitor, biocide and
4 mixtures thereof.
- 1 12. A reinforced shrink wrap of claim 2 wherein the polyethylene is selected from the
2 group consisting of linear low density polyethylene, low density polyethylene and
3 mixtures thereof.
- 1 13. A product cover made of the reinforced shrink wrap of claim 1.

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1 14. A reinforced shrink wrap comprising:

2 a layer of shrink film of highly irradiated polyethylene selected from the
3 group consisting of linear low density polyethylene, low density polyethylene and
4 mixtures thereof between about 0.75 and about 1.5 mils in thickness;

5 a layer of thermoplastic;

6 an elastomeric tie layer laminated between the layer of thermoplastic and the
7 layer of shrink film;

8 a yarn selected from the group consisting of nylon and polyester in a crisscross grid
9 pattern disposed in the elastomeric tie layer, the tie layer of holding yarn but
10 allowing slippage of the yarn in the tie layer upon tensile loading and
wherein the elastomeric tie layer has a lower modulus than the thermoplastic
layer.

11 15. A multi-layered reinforced shrink wrap comprising:

at least three layers of thermoplastic;

at least one of the thermoplastic layers is a shrink film of highly irradiated
polyolefin; and

at least two tie layers of elastomeric material alternatively disposed between
the thermoplastic layers, each holding a reinforcing grid but allowing slippage of the
reinforcing grid in the tie layer upon tensile loading,

wherein the layers of thermoplastic, the tie layers with the grid are laminated
together to form the multi-layered reinforced shrink wrap, and

wherein the elastomeric tie layers have a lower modulus than at least one of
the thermoplastic layers.

1 16. A multi-layered reinforced shrink wrap of claim 15 wherein the shrink film of highly
2 irradiated polyolefin is polyethylene.

1 17. A multi-layered reinforced shrink wrap of claim 15 wherein the reinforcing grid is a
2 non-woven scrim.

- 1 18. A multi-layered reinforced shrink wrap of claim 15 wherein the reinforcing grid is
2 selected from the group consisting of nylon filament and polyester filament from about
3 200 to about 800 denier.
- 1 20. A multi-layered reinforced shrink wrap of claim 15 wherein at least one of said
2 thermoplastic layers includes multiple thermoplastic plies.
- 1 21. A multi-layered reinforced shrink wrap of claim 15 wherein each of the tie layers is
2 from about 0.75 to about 1.5 mils in thickness.
- 1 22. A multi-layered reinforced shrink wrap of claim 15 wherein the thermoplastic layers
2 are from about 0.75 to about 6 mils thick.
- 1 23. A multi-layered reinforced shrink wrap of claim 15 wherein at least one of the
2 thermoplastic layers contains an additive selected from the group consisting of
ultraviolet stabilizer, flame retardant, static inhibitor, color additive, antioxidant,
corrosion inhibitor, biocide and mixtures thereof.
- 1 24. A product cover made of the multi-layered reinforced shrink wrap of claim 15.

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- 1 27. A reinforced shrink wrap obtained by the method comprising:
2 providing two thermoplastic sheets, at least one of the sheets being a shrink
3 film;
4 placing a reinforcing grid between the two thermoplastic sheets;
5 extruding an elastomeric material at an elevated temperature to form a tie
6 layer between the two sheets, the tie layer being in contact with the reinforcing grid
7 and the two thermoplastic sheets;
8 laminating the two sheets and the reinforcing grid with the tie layer to form
9 a reinforced shrink wrap; and
10 controlling the thickness of the tie layer so that the shrink film does not begin
11 to shrink substantially during laminating,
12 wherein the reinforcing grid is held by the elastomeric tie layer between the
13 two thermoplastic sheets after laminating, and
14 wherein the elastomeric layer has a lower modulus than at least one of the
15 thermoplastic layers.
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17 28. The reinforced shrink wrap of claim 27 wherein the shrink film is highly irradiated
18 polyethylene.
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20 29. The reinforced shrink wrap of claim 27 wherein the reinforcing grid is a non-woven
21 scrim.
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